

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – WINTER • 2014****Subject Code: 132601****Date: 20-12-2014****Subject Name: Basic Rubber Science****Time: 02.30 pm - 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Discuss in detail about the preparation of colloidal solution. **07**
- Q.1 (b)** Answer the following
- i** Explain the different types of motions observed in rubber. **04**
- ii** Define the given terms: (i) Creep (ii) Stress Relaxation (iii) Permanent Set **03**
- Q.2 (a)** Discuss the conditions for rubber like elasticity in polymer. **07**
- Q.2 (b)** Answer the following
- i** Write down the general rules for polymer solubility. **04**
- ii** Write about the classification of gel rubber. **03**
- OR**
- Q.2 (b)** Answer the following
- i** Explain the various states associated in rubber goods manufacture. **05**
- ii** Explain the term solubility parameter. **02**
- Q.3 (a)** State the experimental laws of friction. Give the modification to these laws for application to rubber. **07**
- Q.3 (b)** Answer the following
- i** Give an importance of density determination in rubber. Describe the method for determining the relative density of carbon black powder and list the sources of error in it. **05**
- ii** Define the given terms: (i) Angle of Reflection (ii) Angle of Refraction **02**
- OR**
- Q.3 (a)** Discuss in detail about four elastic constants. **07**
- Q.3 (b)** Answer the following
- i** Explain the method to measure the surface tension of Natural Rubber Latex. **05**
- ii** Give the laws of regular reflection. **02**
- Q.4 (a)** Discuss in detail about the emulsion polymerization technique. **07**
- Q.4 (b)** Answer the following
- i** Write a short note on initiators. **04**
- ii** Which types of monomers are suitable for chain growth polymerization? Also give their structures. **03**

OR

Q.4	(a)	List out the types of ionic polymerization. Explain any one in detail.	07
Q.4	(b)	Answer the following	
	i	Write a short note on inhibitors.	05
	ii	What do you mean by inorganic polymer? Give its example with structure.	02
Q.5	(a)	Differentiate the True Solution and Colloidal Solution.	07
Q.5	(b)	Answer the following	
	i	Write down the characteristics of colloidal state.	04
	ii	Explain the term solvent loving sols.	03
OR			
Q.5	(a)	Discuss in detail about the applications of colloids.	07
Q.5	(b)	Answer the following	
	i	Compare three types of colloids.	04
	ii	Explain the term solvent hating sol.	03
